these kits typically include microfluidic devices, systems, modules and workstations for performing the assays of the invention. A kit optionally contains additional components for the assembly and/or operation of a multimodule workstation of the invention including, but not restricted to robotic elements (e.g., a track robot, a robotic armature, or the like), plate handling devices, fluid handling devices, and computers (including e.g., input devices, monitors, CPU, and the like).

[0199] Generally, the microfluidic devices described herein are optionally packaged to include reagents for performing the device's functions. For example, the kits can optionally include any of the microfluidic devices described along with assay components, buffers, reagents, enzymes, serum proteins, receptors, sample materials, antibodies, substrates, control material, spacers, buffers, immiscible fluids, etc., for performing the assays of the invention. In the case of prepackaged reagents, the kits optionally include premeasured or pre-dosed reagents that are ready to incorporate into the assay methods without measurement, e.g., premeasured fluid aliquots, or preweighed or pre-measured solid reagents that can be easily reconstituted by the end-user of the kit.

[0200] Such kits also typically include appropriate instructions for using the devices and reagents, and in cases where reagents are not predisposed in the devices themselves, with appropriate instructions for introducing the reagents into the channels and/or chambers of the device. In this latter case, these kits optionally include special ancillary devices for introducing materials into the microfluidic systems, e.g., appropriately configured syringeslpumps, or the like (in one embodiment, the device itself comprises a pipettor element, such as an electropipettor for introducing material into channels and chambers within the device). In the former case, such kits typically include a microfluidic device with necessary reagents predisposed in the channels/chambers of the device. Generally, such reagents are provided in a stabilized form, so as to prevent degradation or other loss during prolonged storage, e.g., from leakage. A number of stabilizing processes are widely used for reagents that are to be stored, such as the inclusion of chemical stabilizers (i.e., enzymatic inhibitors, microbicides/bacteriostats, anticoagulants), the physical stabilization of the material, e.g., through immobilization on a solid support, entrapment in a matrix (i.e., a bead, a gel, etc.), lyophilization, or the like.

[0201] The elements of the kits of the present invention are typically packaged together in a single package or set of related packages. The package optionally includes written instructions for carrying out one or more target independent assay in accordance with the methods described herein. Kits also optionally include packaging materials or containers for holding microfluidic device, system or reagent elements.

[0202] The discussion above is generally applicable to the aspects and embodiments of the invention described herein. Moreover, modifications are optionally made to the methods and devices described herein without departing from the spirit and scope of the invention as claimed, and the invention is optionally put to a number of different uses including the following:

[0203] The use of a microfluidic system containing at least a first substrate and having a first channel and a second channel intersecting the first channel, at least one of the channels having at least one cross-sectional dimension in a range from 0.1 to 500 μm, in order to test the effect of each of a plurality of test compounds on a biochemical system comprising one or more focused cells or particles.

[0204] The use of a microfluidic system as described herein, wherein a biochemical system flows through one of said channels substantially continuously, providing for, e.g., sequential testing of a plurality of test compounds.

[0205] The use of a microfluidic device as described herein to modulate reactions within microchannels.

[0206] The use of electrokinetic injection in a microfluidic device as described herein to modulate or achieve flow in the channels.

[0207] The use of a combination of wicks, electrokinetic injection and pressure based flow elements in a microfluidic device as described herein to modulate, focus, or achieve flow of materials, e.g., in the channels of the device.

[0208] An assay utilizing a use of any one of the microfluidic systems or substrates described herein.

[0209] While the foregoing invention has been described in some detail for purposes of clarity and understanding, it will be clear to one skilled in the art from a reading of this disclosure that various changes in form and detail can be made without departing from the true scope of the invention. For example, all the techniques and apparatus described above can be used in various combinations. All publications, patents, patent applications, or other documents cited in this application are incorporated by reference in their entirety for all purposes to the same extent as if each individual publication, patent, patent application, or other document were individually indicated to be incorporated by reference for all purposes.

SEQUENCE LISTING

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